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PCT App. No.: PCT/FI2003/000853

Claim Listing

1–10. (cancelled)

11. A core locking device in a two-drum winder, comprising:
locking members for locking the device to a winding core of a roll to be wound on the
two-drum winder, which device is placed on a slide arranged in connection
with the two-drum winder, which locking device moves, as winding
progresses, with a center of the roll being formed along the slide, the core
locking device moving with the center of the roll being formed forwards on
the slide, so that the core locking device will gradually be at an angle with
respect to the slide, with the result that a force is produced in the center of the
roll because of the weight of the core locking device; and
an actuator arranged to produce a counterforce for the force caused by the mass of the
core locking device in the changed position of the core locking device.

12. (new) The device of claim 11, wherein the actuator is a hydraulic cylinder.

13. (new) The device of claim 11, wherein the actuator is a semi-rotary actuator.

14. (new) The device of claim 11 further comprising:
a frame structure mounted to the slide, the locking members being pivotably mounted
to the frame structure; and
an angle sensor arranged in connection with the actuator for measuring the pivoting
angle of the locking members with respect to the frame structure to determine
the magnitude of the necessary counterforce.

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15. (new) The device of claim 14 wherein the actuator and the sensor are arranged to form an active damper in which the action of the actuator is changed based on the measurement result provided by the sensor.

16. (new) The device of claim 11 wherein the actuator is arranged to form a passive damper in which the actuator is a hydraulic cylinder, a change in damping being achieved by changing the flow of the hydraulic cylinder.

17. (new) The device of claim 14 wherein the actuator and the sensor are arranged to serve as a device that detects and/or eliminates a bouncing phenomenon.

18. (new) The device of claim 11 wherein the device is configured for use in a two-drum winder which uses as one winding drum a set of drums around which a belt has been disposed, the change of the starting position of winding caused by wear of the belt being compensated for by the location of the device.

19. (new) The device of claim 11 wherein the force caused by the mass of the core locking device is static or dynamic.

20. (new) The device of claim 11 wherein the device (17) is disposed in connection with a variable geometry two-drum winder.

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21. (new) A core locking device for use with a two-drum winder having a first drum and a second drum, and a roll being wound thereon on a winding core, the two-drum winder having an upwardly extending slide, the core locking device having a weight and comprising:

locking members for locking the device to the winding core of the roll;
a frame structure mounted to the slide; the locking members being pivotably mounted to the frame structure so that during winding of the roll on the two-drum winder, the locking members pivot with respect to the frame structure and the slide;
a sensor disposed to measure the pivoting angle of the locking members with respect to the frame structure; and
an actuator extending between the locking members and the frame structure, the actuator arranged to respond to the sensor to produce a counter force to a force caused by the weight of the core locking device as it is pivots on the frame structure.

22. (new) The device of claim 21, wherein the actuator is a hydraulic cylinder.

23. (new) The device of claim 21, wherein the actuator is a semi-rotary actuator.

24. (new) The device of claim 21 wherein the actuator and the sensor are arranged to form an active damper in which the action of the actuator is changed based on the measurement result provided by the sensor.

25. (new) The device of claim 21 wherein the actuator is arranged to form a passive damper in which the actuator is a hydraulic cylinder, a change in damping being achieved by changing the flow of the hydraulic cylinder.

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26. (new) The device of claim 21 wherein the device is configured for use in a two-drum winder which uses as one winding drum a set of drums around which a belt has been disposed, the change of the starting position of winding caused by wear of the belt being compensated for by the location of the device.

27. (new) The device of claim 21 wherein the force caused by the mass of the core locking device is static or dynamic.

28. (new) The device of claim 21 wherein the device is disposed in connection with a variable geometry two-drum winder.

29. (new) A core locking device having a weight and comprising:
locking members for locking the device to a winding core of a roll to be wound on a two-drum winder,

a frame structure for mounting to a slide arranged in connection with the two-drum winder, the locking members being pivotably mounted to the frame structure, and wherein as winding progresses on the two-drum winder, the core locking device moves with the center of the roll being formed along the slide so that the locking members pivot with respect to the frame structure and the slide, with the result that a force is produced in the center of the roll because of the weight of the core locking device; and

an actuator mounted between the frame structure and the locking members to produce a counterforce for the force caused by the mass of the core locking device in the changed position of the core locking device.

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30. (new) A method for winding a paper roll on a two-drum winder, comprising the steps of:

winding the paper roll about a core having a center which is supported on the two-drum winder, the core being locked to locking members of a core locking device, the locking members being pivotably mounted to a frame structure which is mounted to a slide arranged in connection with the two-drum winder; as winding progresses on the two-drum winder, measuring the pivot angle between the frame structure and the locking members, the locking device moving with the center of the roll being formed along the slide so that the locking members pivot with respect to the frame structure and the slide, with the result that a force is produced in the center of the roll because of the weight of the core locking device; and
producing a counterforce for the force caused by the weight of the core locking device as its position changes, and applying the counterforce to act upon the roll center.

31. (new) The device of claim 30 further comprising the steps of measuring the pivot angle and producing a counterforce to detect and/or eliminate a bouncing phenomenon.

32. (new) The device of claim 30 wherein the measurement of the pivot angle and the production of the counterforce serve to perform active damping.

33. (new) The device of claim 30 wherein the step of producing a counterforce comprises applying a force through an actuator which extends between the locking members and the frame structure.

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34. (new) The device of claim 39 wherein the two-drum winder uses as one winding drum a set of drums around which a belt has been disposed, and further comprising the step of compensating for a change of a starting position of winding caused by wear by the position of the device.